Ramp: Forces and Motion Simulation
Honors Physics

23 Points Total

Instructions and Rubric:

1. Go to http://phet.colorado.edu; play with sims; physics; motion; ramp: forces and motion; run now.
2. There are four tabs on the top of the simulation: Introduction, Friction, Force Graphs, and Robot Moving Company. Click the Introduction tab.
3. Change the angle to 15º and make the box come to rest on the incline. Apply some force up the ramp (clicking and dragging with the cursor is easier than typing in numbers) and draw the free-body diagram of the instant when the box begins to move (2 points).
4. What is the force needed to start the box in motion up the ramp (2 points)?
5. Change the angle to 25º and repeat #4 (1 point).
6. Change the angle to 35º and repeat #4 (1 point).
7. Change the angle to 45º and repeat #4 (1 point).
8. Change the angle to 55º and repeat #4 (1 point).
9. Change the angle to 65º and repeat #4 (1 point).
10. Change the angle to 75º and repeat #4 (1 point).
11. Which angle requires the greatest force to move the box (1 point)? Why (3 points)?
12. Change the object to the mystery object and the angle to 30 degrees. The mass of the mystery object is 120 kg. Determine the coefficient of static friction of the object.
    1. Free-body diagram (3 points).
    2. Calculations (5 points).
13. Click the Robot Moving Company tab. Play the game a minimum of five times using your knowledge of forces to achieve a high score. Record your highest score (1 point).